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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/648,657 | 08/25/2000 | Yoshimasa Chikama | 55058(820) | 5508 |

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| EXAMINER |
|---|
| ALANKO, ANITA KAREN |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1765 | |

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. 09/648,657 | Applicant(s) CHIKAMA ET AL. | |
|---|---|---|---|
| | Examiner Anita K Alanko | Art Unit 1765 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *RCE 7/28/03* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,2,4-9 and 11-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9 and 11-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

***Information Disclosure Statement***

The search report and Korean office action are missing from the IDS submission filed 8/13/02. The search report does not appear to be attached to amendment "b" filed 6/23/03 or the RCE filed Feb.10, 2003.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claims 1-2, 4, 6-7, 9 and 11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takada et al (US 4,629,681).***

Takada discloses a method comprising (col.3, lines 6-38, col.4, lines 1-3):

forming a ground resin film 6 by applying a resin onto an insulating substrate 1 (a ceramic);

patterning the ground resin film (Fig.3, to form through-holes);

forming a low-resistance metal film 8 selectively over the patterned group resin film by a wet film formation technique such that the low-resistance metal film encloses the patterned ground resin film (since nickel is deposited on the whole surface of the substrate, including the wall surface of the through holes 7 and on the exposed portions of the first conductor layer 2, col.3, lines 25-30; and copper is deposited as a blanket layer (and then later patterned to what is shown in Figure 4) col.3, lines 32-37),

wherein the low-resistance metal film is a single layer film containing Cu or Ni, or a multilayer film containing Cu or Ni (Fig.4).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

***Claims 1-2,4, 6-9, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of JP 10-245,444 and Larsson et al (U.S. Patent No. 6,303,278 B1).***

The discussion of Takada from above is repeated here.

As to claims 8, 12 and 14 Takada does not teach to reduce metal ions by irradiating ultraviolet rays and KOH treatment.

JP 10-245,444 teaches a useful method for forming a metal film on polyimide with excellent adhesion force (paragraph [0004]), including: forming a polyimide resin film, followed by modifying the surface with KOH, reducing metal ions and plating (see Example, paragraphs [0016]-[0018] of translation).

It would have been obvious to one with ordinary skill in the art to form the metal on the polyimide film in the method of Takada using the method of JP 10-245,444 of modifying the polyimide surface and then plating because JP 10-245,444 teaches that it is useful for forming a film with excellent adhesion force.

Further, as to claim 14, JP 10-245,444 discloses to use a solution to reduce the nickel metal ions to nickel. Larsson teaches that an equivalent alternative technique for using a solution for the reduction is a photochemical technique (col.5, lines 34-41). Larsson teaches that ultraviolet light is useful for the reduction process (col.7, line 35). It would have been obvious to use ultraviolet light to reduce the metal ions to metal in the method of Takada modified by JP 10-245,444 because Larsson teaches that this is a useful, functionally equivalent technique compared to solution processing.

***Claims 1-2, 4-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of Iwasaki et al (U.S. Patent No. 5,323,534).***

The discussion of Takada from above is repeated here.

As to claim 5, Takada does not teach add catalyst to the resin. Iwasaki teaches that adding a catalyst to resins is conventional in order to prepare for subsequent plating (col.11, lines 63-65). It would have been obvious to one with ordinary skill in the art to add the catalyst to the resin in the method of Takada in order to save time and money and decrease contamination by not requiring multiple steps for forming catalyst films, and because it is a conventional technique in plating as taught by Iwasaki.

***Claims 1-2, 4, 6-7, 9, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of Kishomoto et al (U.S. Patent No. 5,516,983).***

The discussion of Takada from above is repeated here.

As to claim 15, Takada does not disclose the thickness of the polyimide layer. The method of Takada is directed to making a multilayer circuit board. Kishimoto teaches that polyimide layers of 0.3 microns, which is within the cited range, are useful thicknesses for electronic devices (col.6, example 3). It would have been obvious to one with ordinary skill in the art to form the polyimide layer in the method of Takada to the cited thickness because Kishimoto teaches that thicknesses on the same order of magnitude are useful for forming electronic devices.

***Response to Amendment***

The rejection over O'Sullivan is withdrawn because O'Sullivan does not suggest to form a metal film that encloses the patterned ground resin film.

Claims 1-2, 4, 6-7, 9 and 11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Takada et al (US 4,629,681).

Claims 1-2,4, 6-9, 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of JP 10-245,444 and Larsson et al (U.S. Patent No. 6,303,278 B1).

Claims 1-2, 4-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of Iwasaki et al (U.S. Patent No. 5,323,534).

Claims 1-2, 4, 6-7, 9, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al (US 4,629,681) in view of Kishomoto et al (U.S. Patent No. 5,516,983).

***Response to Arguments***

Applicant's arguments filed 7/28/03 have been fully considered.

Applicant argues that Tanaka fails to disclose that the metal layer encloses the insulating layer, or that the metal layer coats all exposed surfaces of the insulating layer. However, this is inherent in the method of Tanaka because the film is formed on the whole surface and then patterned to form what is shown in Figure 4. Tanaka does not depict the intermediate step of enclosing, but it is inherent.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 703-305-7708. The examiner can normally be reached on Monday, Tuesday and Friday, 8:00 am-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 703-305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Anita K. Alanko

Anita K Alanko
Primary Examiner
Art Unit 1765